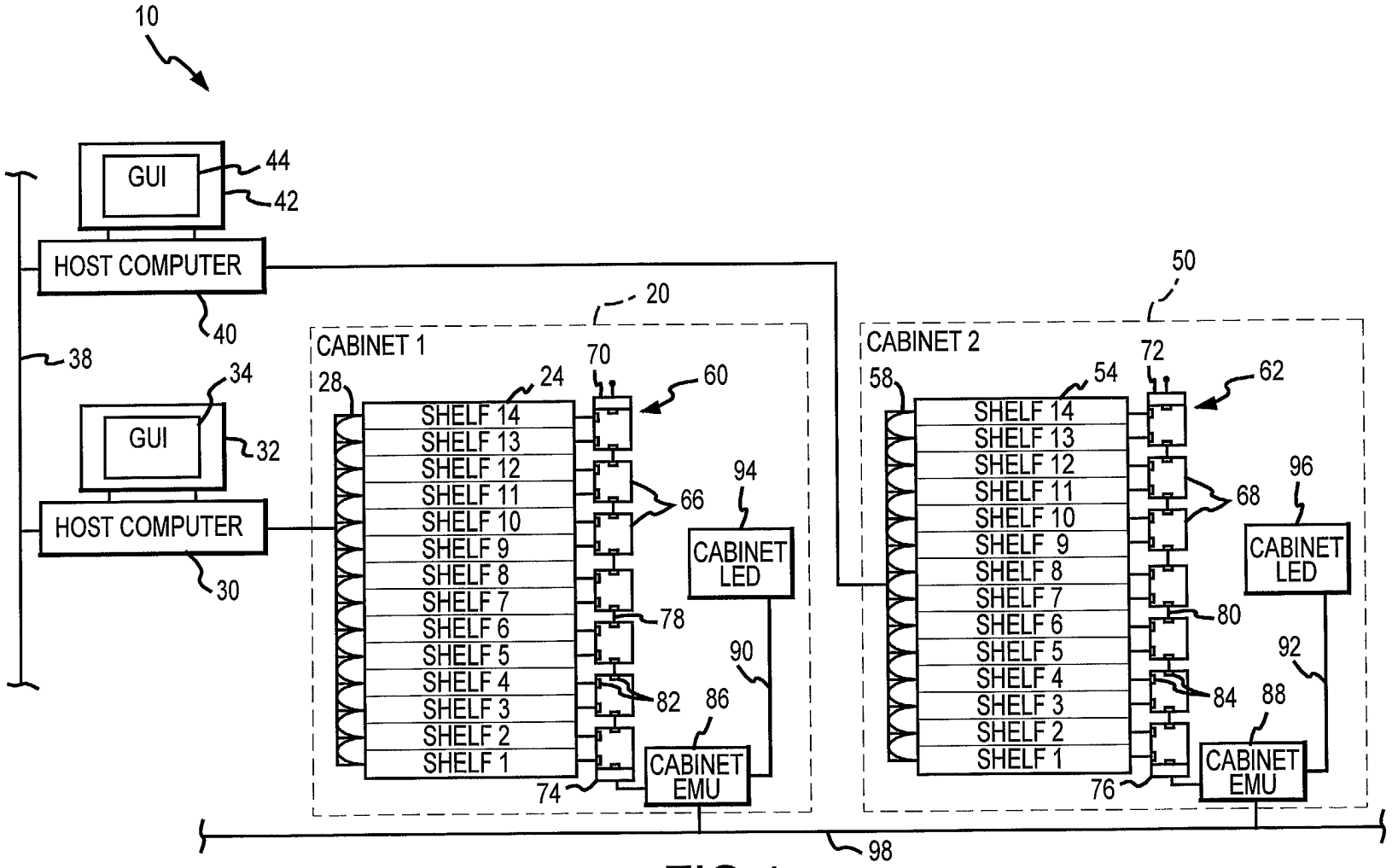

10
GUI
44
42
HOST COMPUTER
40
38
34
GUI
32
HOST COMPUTER
30
20
CABINET 1
28
24
70
60
SHELF 14
SHELF 13
SHELF 12
SHELF 11
SHELF 10
SHELF 9
SHELF 8
SHELF 7
SHELF 6
SHELF 5
SHELF 4
SHELF 3
SHELF 2
SHELF 1
66
94
CABINET LED
78
90
82
86
CABINET EMU
74
50
CABINET 2
58
54
72
62
68
96
80
92
84
88
76
98

FIG.1

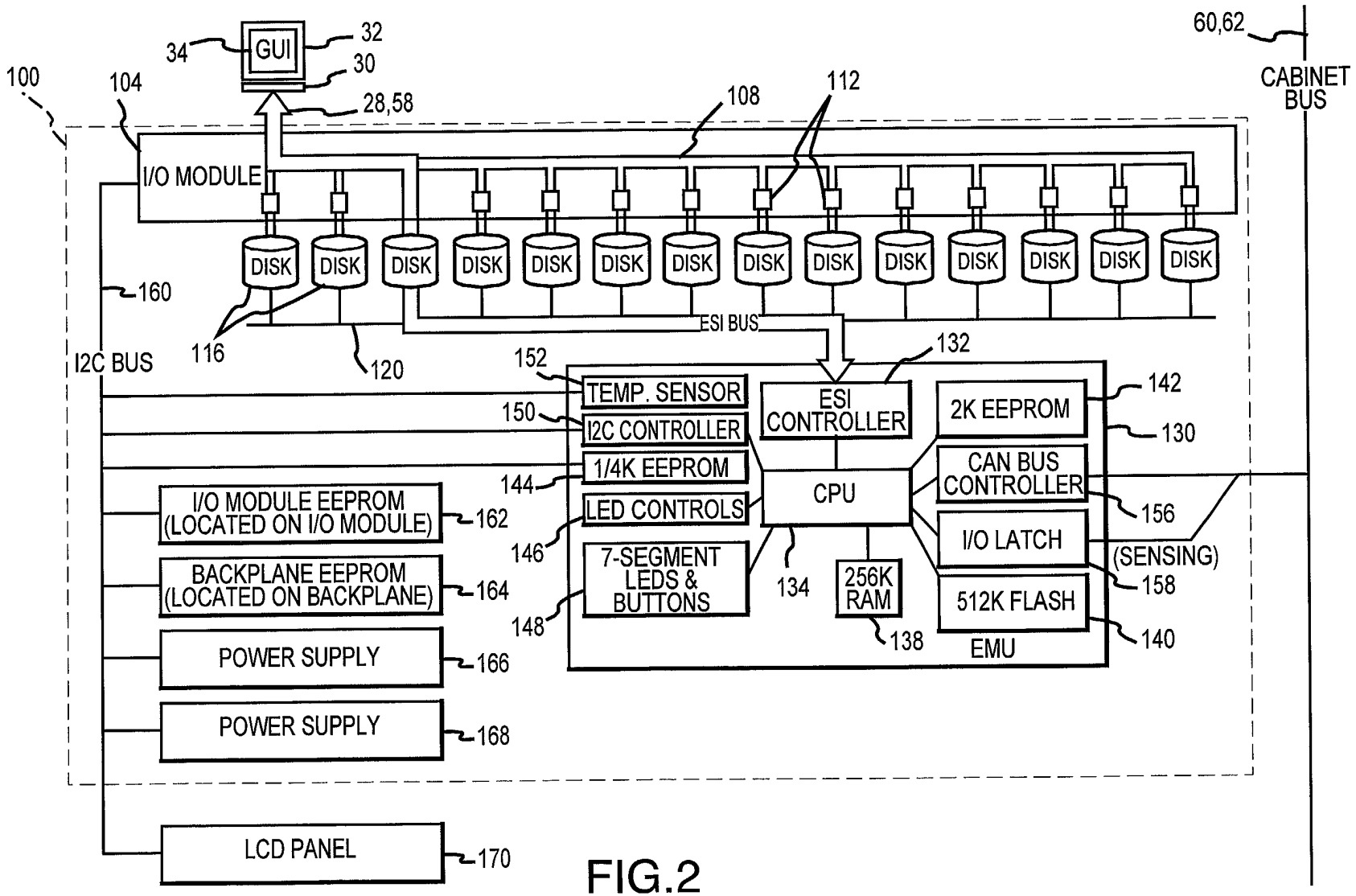

100
104
GUI
34
32
30
28,58
60,62
CABINET BUS
I/O MODULE
108
112
DISK
160
116
120
ESI BUS
I2C BUS
152
132
TEMP. SENSOR
ESI CONTROLLER
2K EEPROM
142
150
I2C CONTROLLER
130
1/4K EEPROM
CAN BUS CONTROLLER
144
CPU
I/O MODULE EEPROM (LOCATED ON I/O MODULE)
162
LED CONTROLS
156
BACKPLANE EEPROM (LOCATED ON BACKPLANE)
164
146
7-SEGMENT LEDS & BUTTONS
I/O LATCH
(SENSING)
158
134
256K RAM
512K FLASH
POWER SUPPLY
166
148
138
EMU
140
POWER SUPPLY
168
LCD PANEL
170

FIG.2

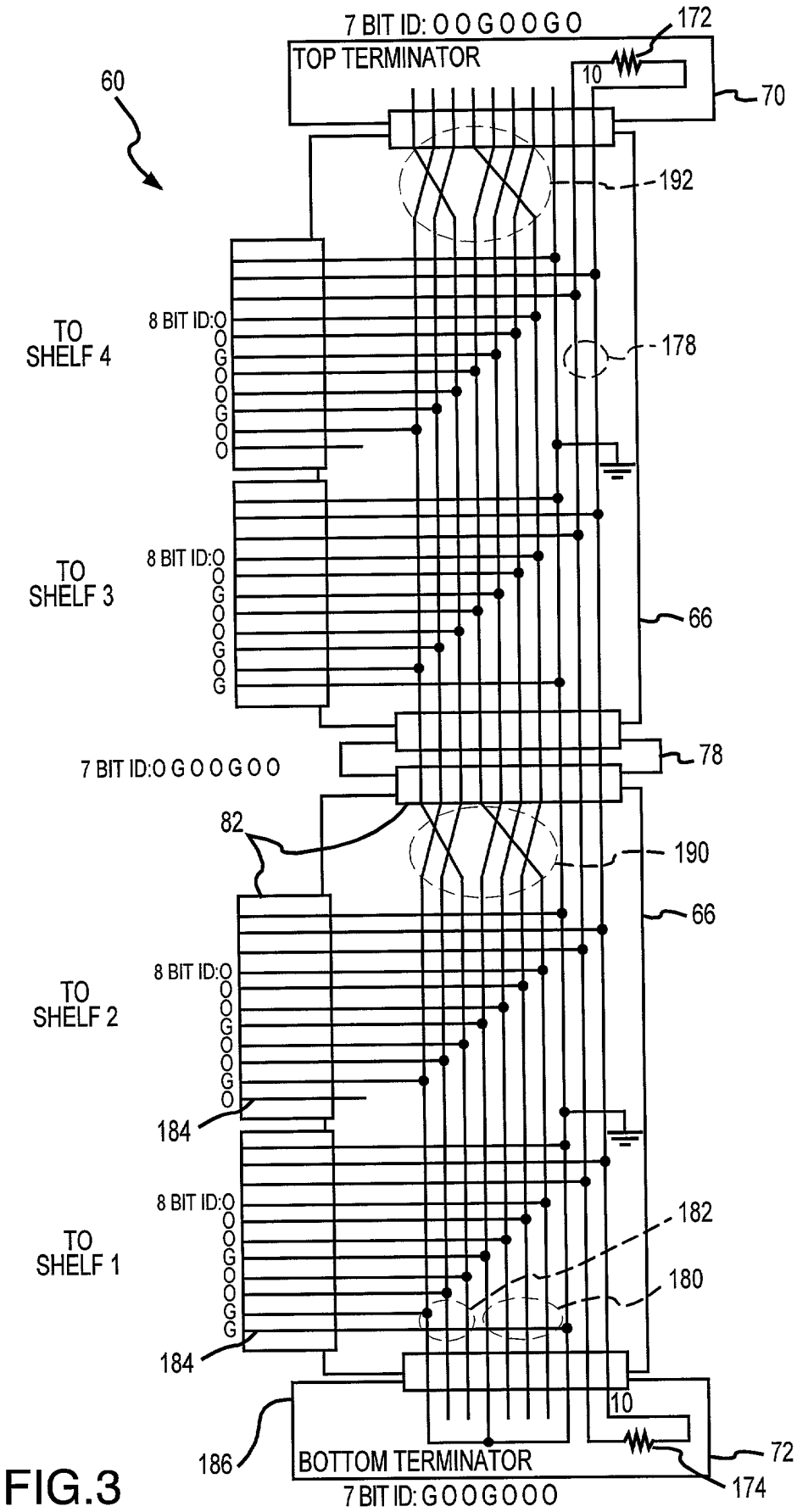

7 BIT ID: O O G O O G O
172
TOP TERMINATOR
10
70
60
192
TO SHELF 4
8 BIT ID:O O O G O O O G
178
TO SHELF 3
8 BIT ID:O O O G O O O G
66
7 BIT ID:O G O O G O O
78
82
190
66
TO SHELF 2
8 BIT ID:O O O O G O O O
184
TO SHELF 1
8 BIT ID:O O O O G O O O
182
180
184
10
186
BOTTOM TERMINATOR
72
174
7 BIT ID: G O O G O O O

FIG.3

SHELF ID	BITS 7..4	BITS 3..1	BIT 0
1	1110	110	0
2	1110	110	1
3	1101	101	0
4	1101	101	1
5	1011	011	0
6	1011	011	1
7	0111	110	0
8	0111	110	1
9	1110	101	0
10	1110	101	1
11	1101	011	0
12	1101	011	1
13	1011	110	0
14	1011	110	1
15	0111	101	0
16	0111	101	1
17	1110	011	0
18	1110	011	1
19	1101	110	0
20	1101	110	1
21	1011	101	0
22	1011	101	1
23	0111	011	0
24	0111	011	1
CABINET CABLE DISCONNECTED	1111	XXX	X
CABINET CABLE DISCONNECTED	XXXX	111	X

FIG.4

EP 0 767 435 A2

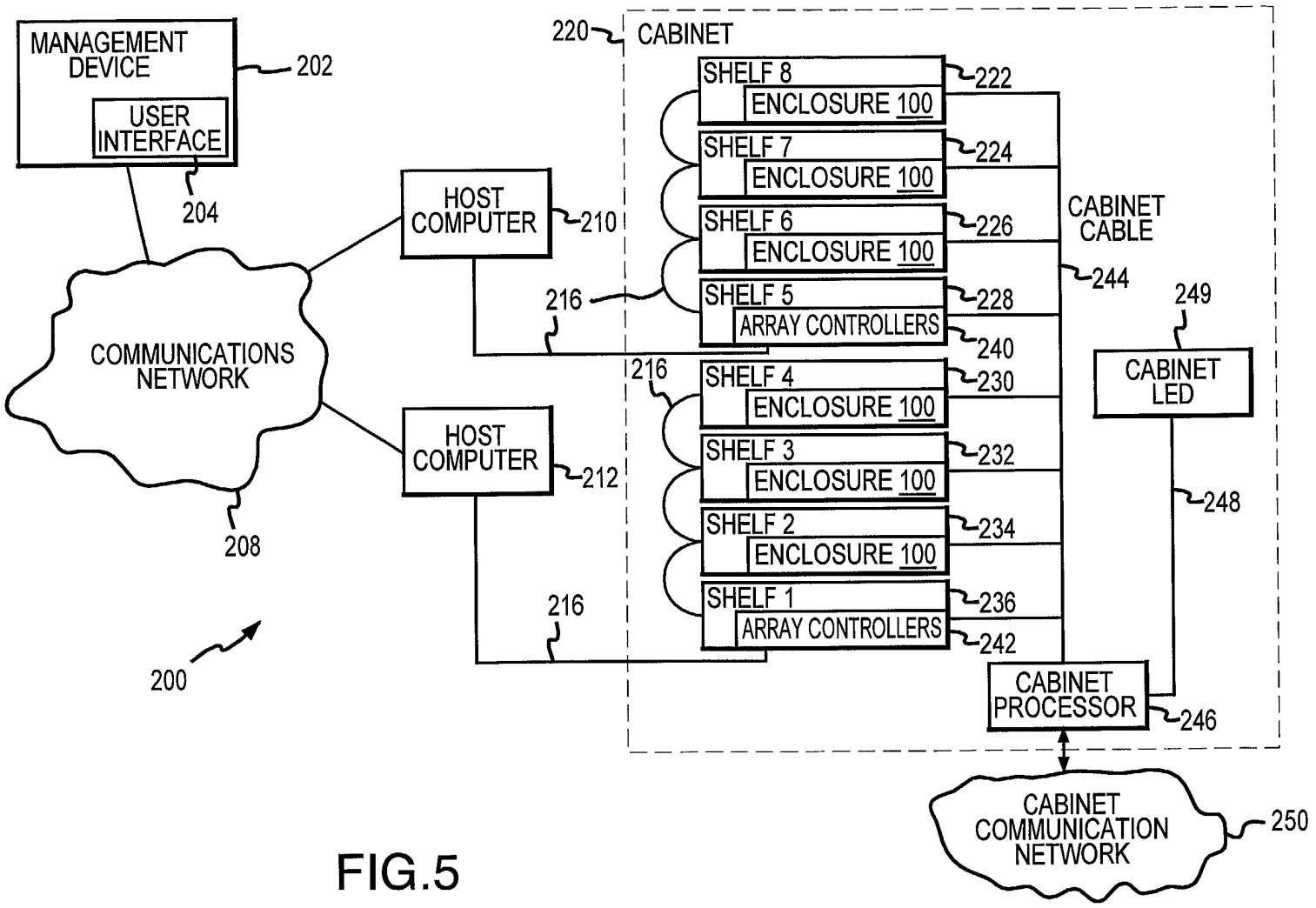

MANAGEMENT DEVICE
202
USER INTERFACE
204
HOST COMPUTER
210
HOST COMPUTER
212
COMMUNICATIONS NETWORK
208
200
220
CABINET
SHELF 8
ENCLOSURE 100
222
SHELF 7
ENCLOSURE 100
224
SHELF 6
ENCLOSURE 100
226
SHELF 5
ARRAY CONTROLLERS
228
240
SHELF 4
ENCLOSURE 100
230
SHELF 3
ENCLOSURE 100
232
SHELF 2
ENCLOSURE 100
234
SHELF 1
ARRAY CONTROLLERS
236
242
216
216
216
CABINET CABLE
244
249
CABINET LED
248
CABINET PROCESSOR
246
CABINET COMMUNICATION NETWORK
250

FIG.5

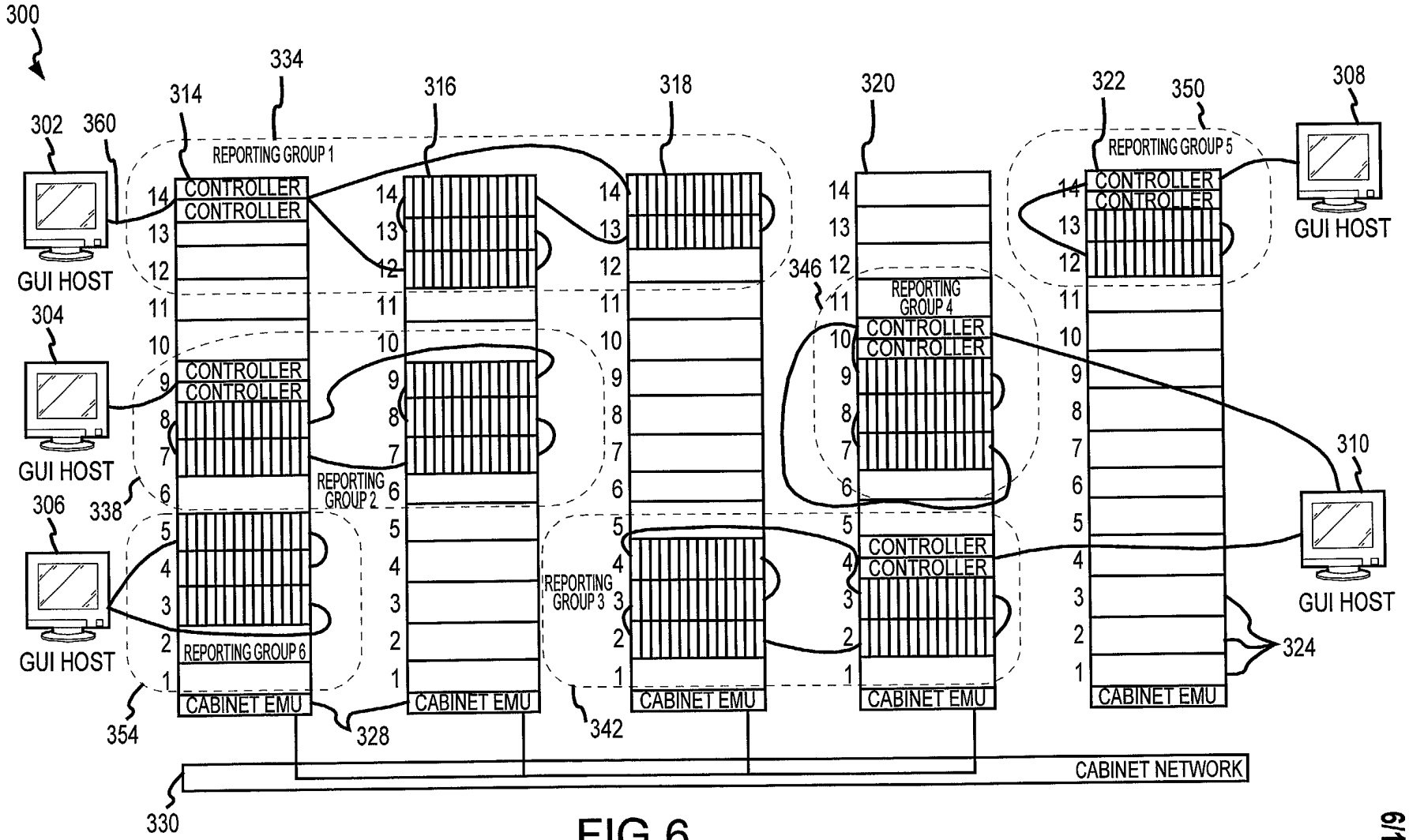

300
334
314
316
318
320
322
350
308
302
360
REPORTING GROUP 1
GUI HOST
304
CONTROLLER
CONTROLLER
REPORTING GROUP 5
GUI HOST
REPORTING GROUP 4
346
310
306
338
REPORTING GROUP 2
REPORTING GROUP 3
GUI HOST
REPORTING GROUP 6
324
GUI HOST
CABINET EMU
354
328
342
CABINET NETWORK
330

FIG.6

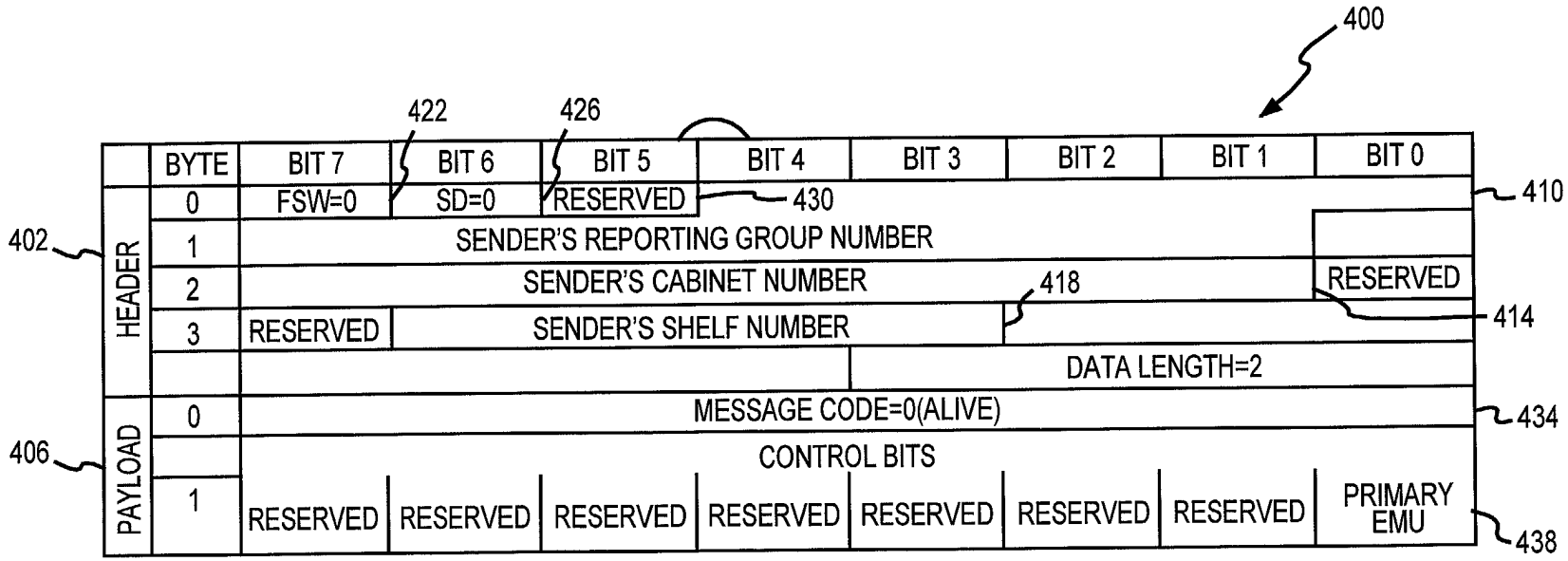

400
422
426
BYTE
BIT 7
BIT 6
BIT 5
BIT 4
BIT 3
BIT 2
BIT 1
BIT 0
HEADER
PAYLOAD
0
FSW=0
SD=0
RESERVED
430
410
402
1
SENDER'S REPORTING GROUP NUMBER
2
SENDER'S CABINET NUMBER
RESERVED
418
3
RESERVED
SENDER'S SHELF NUMBER
414
DATA LENGTH=2
0
MESSAGE CODE=0(ALIVE)
434
406
CONTROL BITS
1
RESERVED
RESERVED
RESERVED
RESERVED
RESERVED
RESERVED
RESERVED
PRIMARY EMU
438

FIG.7

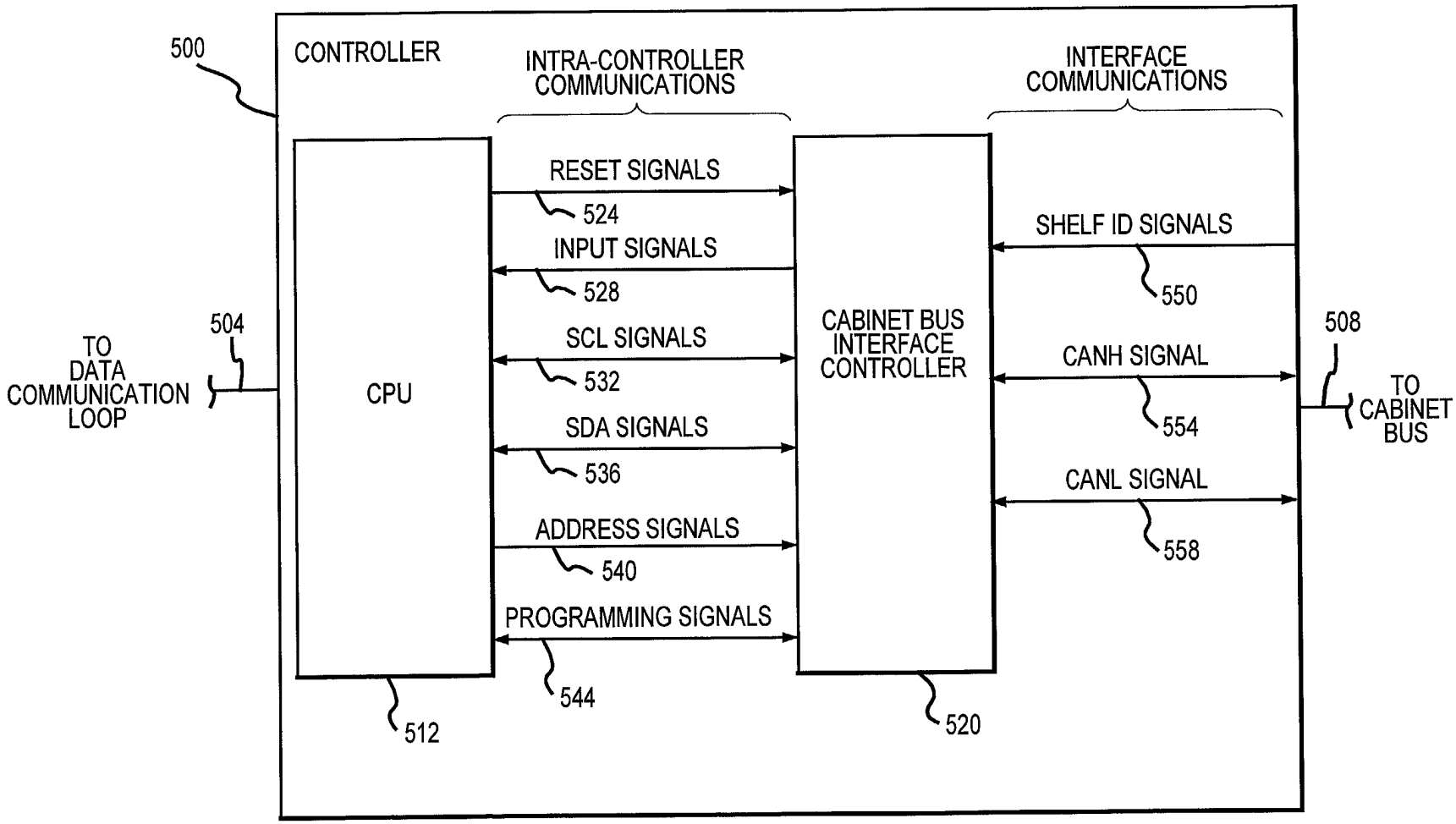

500
CONTROLLER
INTRA-CONTROLLER COMMUNICATIONS
INTERFACE COMMUNICATIONS
RESET SIGNALS
524
INPUT SIGNALS
528
SCL SIGNALS
532
SDA SIGNALS
536
ADDRESS SIGNALS
540
PROGRAMMING SIGNALS
544
SHELF ID SIGNALS
550
CANH SIGNAL
554
CANL SIGNAL
558
504
TO DATA COMMUNICATION LOOP
CPU
512
CABINET BUS INTERFACE CONTROLLER
520
508
TO CABINET BUS

FIG.8

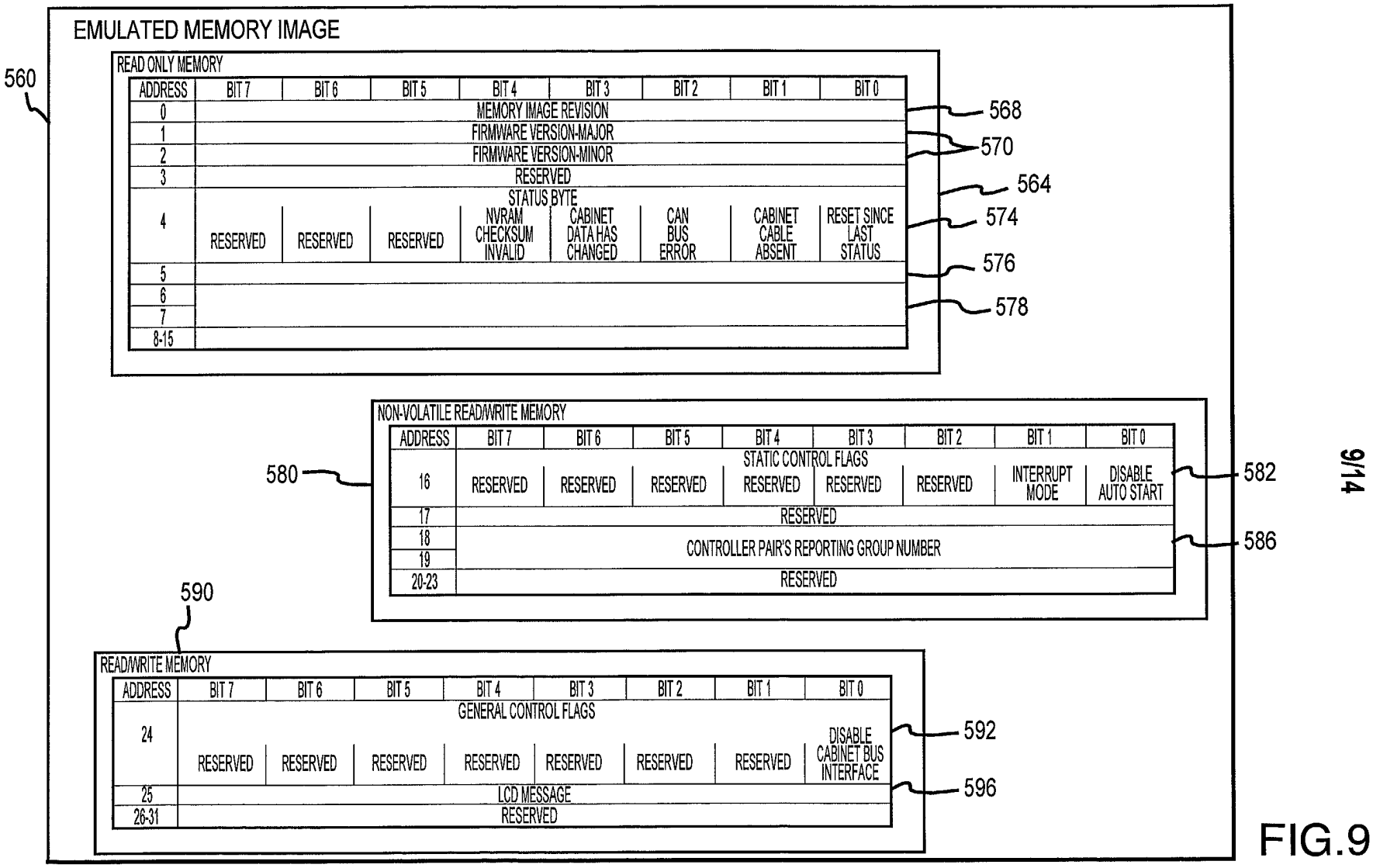

EMULATED MEMORY IMAGE
560
READ ONLY MEMORY
ADDRESS | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0
0 | MEMORY IMAGE REVISION
1 | FIRMWARE VERSION-MAJOR
2 | FIRMWARE VERSION-MINOR
3 | RESERVED
4 | STATUS BYTE: RESERVED | RESERVED | RESERVED | NVRAM CHECKSUM INVALID | CABINET DATA HAS CHANGED | CAN BUS ERROR | CABINET CABLE ABSENT | RESET SINCE LAST STATUS
5
6
7
8-15
568
570
564
574
576
578
NON-VOLATILE READ/WRITE MEMORY
580
ADDRESS | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0
16 | STATIC CONTROL FLAGS: RESERVED | RESERVED | RESERVED | RESERVED | RESERVED | RESERVED | INTERRUPT MODE | DISABLE AUTO START
17 | RESERVED
18
19 | CONTROLLER PAIR'S REPORTING GROUP NUMBER
20-23 | RESERVED
582
586
590
READ/WRITE MEMORY
ADDRESS | BIT 7 | BIT 6 | BIT 5 | BIT 4 | BIT 3 | BIT 2 | BIT 1 | BIT 0
24 | GENERAL CONTROL FLAGS: RESERVED | RESERVED | RESERVED | RESERVED | RESERVED | RESERVED | RESERVED | DISABLE CABINET BUS INTERFACE
25 | LCD MESSAGE
26-31 | RESERVED
592
596

FIG.9

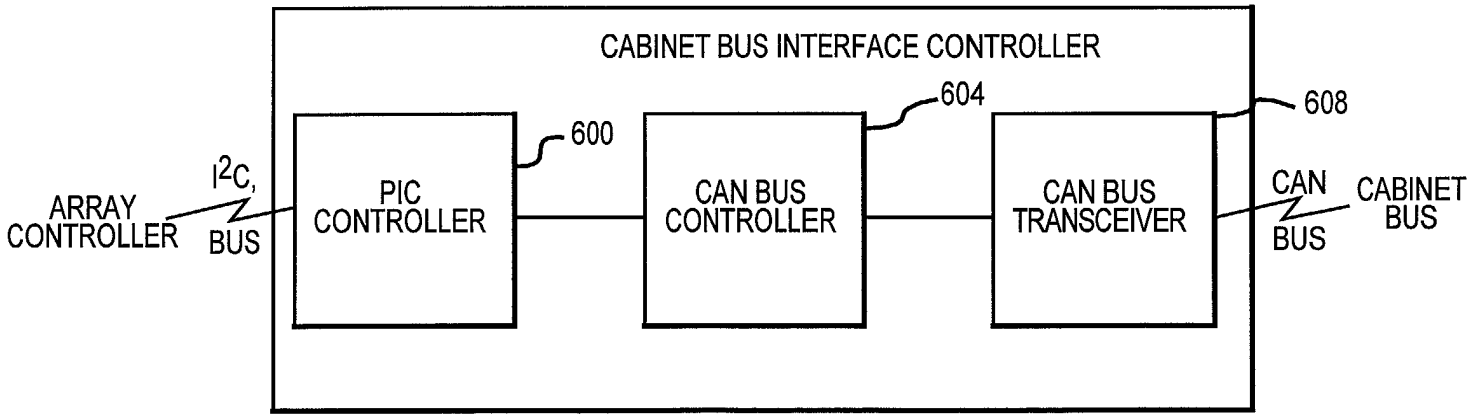
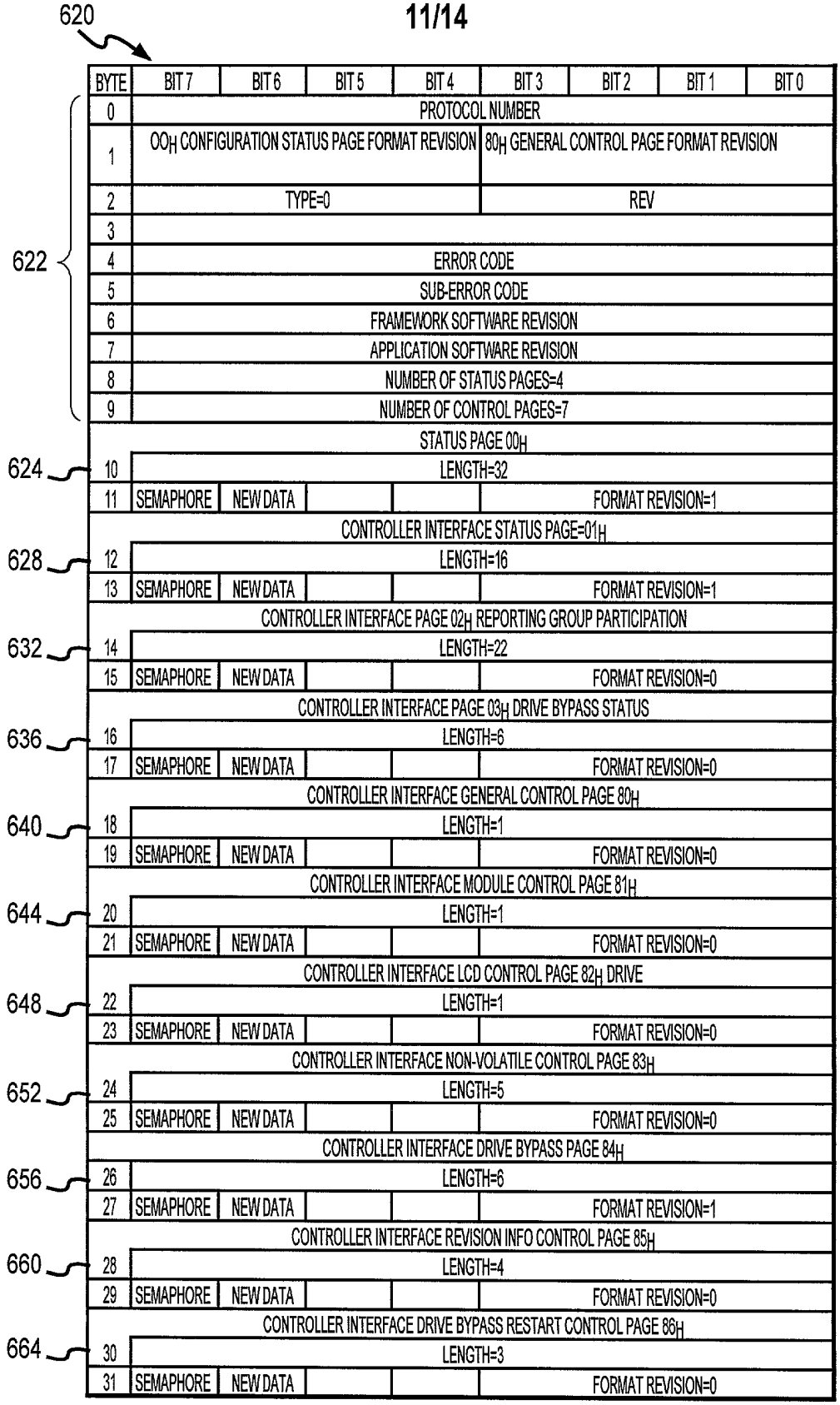

CABINET BUS INTERFACE CONTROLLER
604
608
600
ARRAY CONTROLLER
I2C, BUS
PIC CONTROLLER
CAN BUS CONTROLLER
CAN BUS TRANSCEIVER
CAN BUS
CABINET BUS

FIG.10



BYTE	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
0	PROTOCOL NUMBER							
1	00_H CONFIGURATION STATUS PAGE FORMAT REVISION				80_H GENERAL CONTROL PAGE FORMAT REVISION			
2	TYPE=0				REV			
3								
4	ERROR CODE							
5	SUB-ERROR CODE							
6	FRAMEWORK SOFTWARE REVISION							
7	APPLICATION SOFTWARE REVISION							
8	NUMBER OF STATUS PAGES=4							
9	NUMBER OF CONTROL PAGES=7							
	STATUS PAGE 00_H							
10	LENGTH=32							
11	SEMAPHORE	NEW DATA			FORMAT REVISION=1			
	CONTROLLER INTERFACE STATUS PAGE=01_H							
12	LENGTH=16							
13	SEMAPHORE	NEW DATA			FORMAT REVISION=1			
	CONTROLLER INTERFACE PAGE 02_H REPORTING GROUP PARTICIPATION							
14	LENGTH=22							
15	SEMAPHORE	NEW DATA			FORMAT REVISION=0			
	CONTROLLER INTERFACE PAGE 03_H DRIVE BYPASS STATUS							
16	LENGTH=6							
17	SEMAPHORE	NEW DATA			FORMAT REVISION=0			
	CONTROLLER INTERFACE GENERAL CONTROL PAGE 80_H							
18	LENGTH=1							
19	SEMAPHORE	NEW DATA			FORMAT REVISION=0			
	CONTROLLER INTERFACE MODULE CONTROL PAGE 81_H							
20	LENGTH=1							
21	SEMAPHORE	NEW DATA			FORMAT REVISION=0			
	CONTROLLER INTERFACE LCD CONTROL PAGE 82_H DRIVE							
22	LENGTH=1							
23	SEMAPHORE	NEW DATA			FORMAT REVISION=0			
	CONTROLLER INTERFACE NON-VOLATILE CONTROL PAGE 83_H							
24	LENGTH=5							
25	SEMAPHORE	NEW DATA			FORMAT REVISION=0			
	CONTROLLER INTERFACE DRIVE BYPASS PAGE 84_H							
26	LENGTH=6							
27	SEMAPHORE	NEW DATA			FORMAT REVISION=1			
	CONTROLLER INTERFACE REVISION INFO CONTROL PAGE 85_H							
28	LENGTH=4							
29	SEMAPHORE	NEW DATA			FORMAT REVISION=0			
	CONTROLLER INTERFACE DRIVE BYPASS RESTART CONTROL PAGE 86_H							
30	LENGTH=3							
31	SEMAPHORE	NEW DATA			FORMAT REVISION=0			

FIG.11

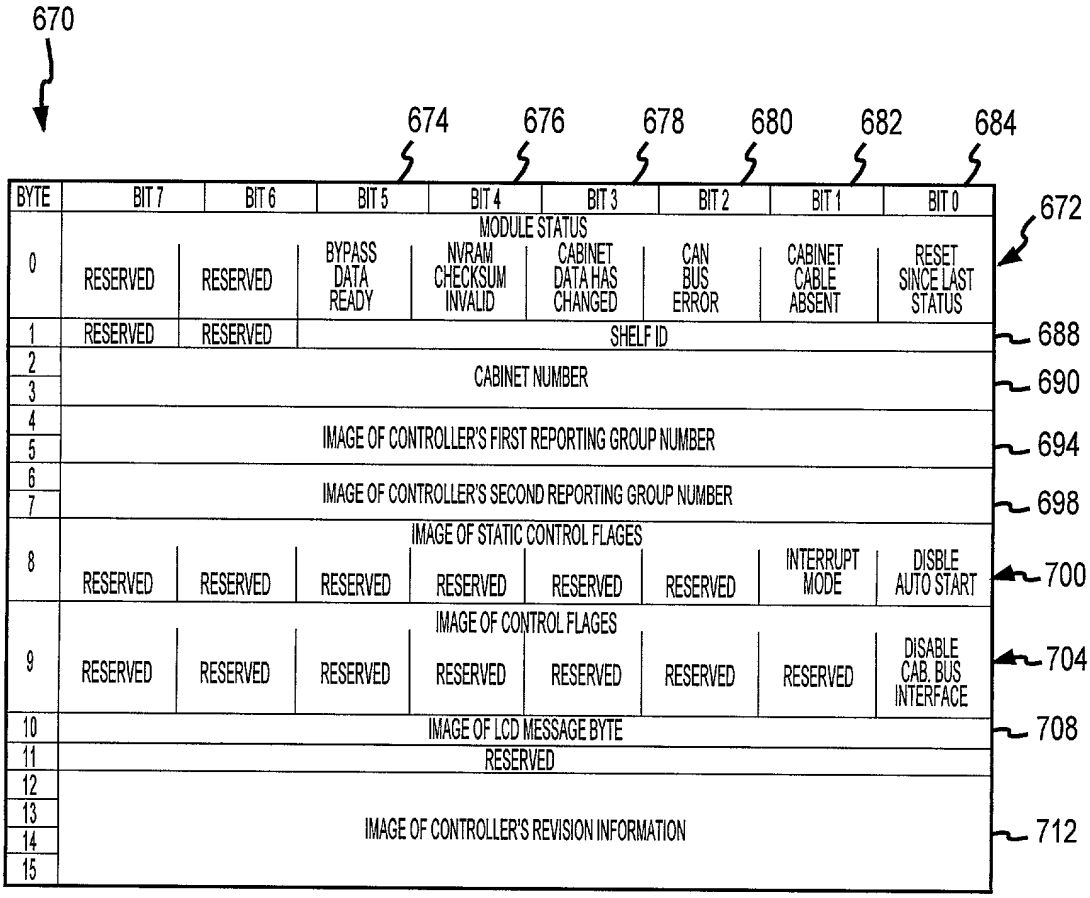
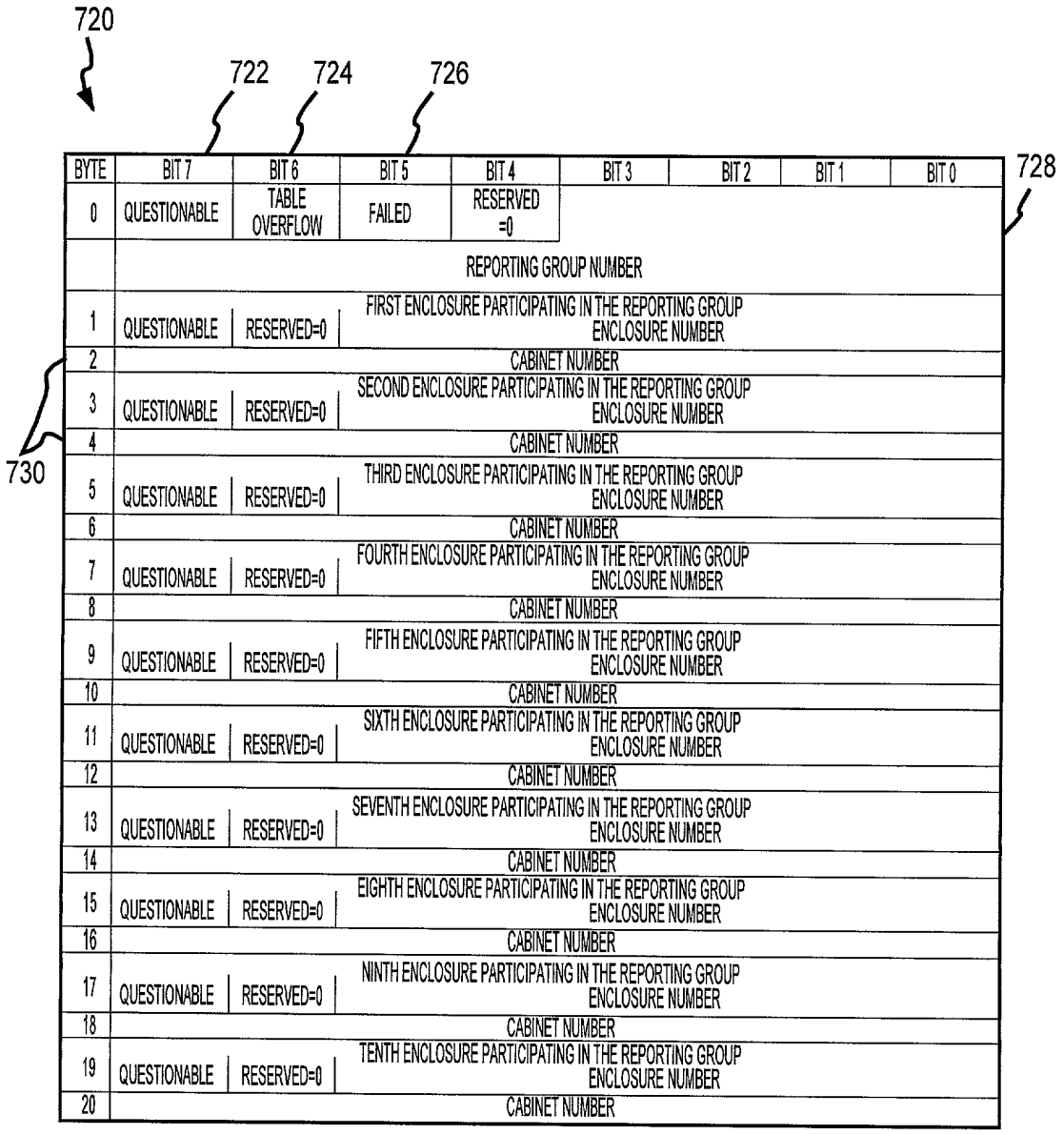

670
674
676
678
680
682
684
672
688
690
694
698
700
704
708
712
BYTE
BIT 7
BIT 6
BIT 5
BIT 4
BIT 3
BIT 2
BIT 1
BIT 0
0
MODULE STATUS
RESERVED
RESERVED
BYPASS DATA READY
NVRAM CHECKSUM INVALID
CABINET DATA HAS CHANGED
CAN BUS ERROR
CABINET CABLE ABSENT
RESET SINCE LAST STATUS
1
RESERVED
RESERVED
SHELF ID
2
3
CABINET NUMBER
4
5
IMAGE OF CONTROLLER'S FIRST REPORTING GROUP NUMBER
6
7
IMAGE OF CONTROLLER'S SECOND REPORTING GROUP NUMBER
8
IMAGE OF STATIC CONTROL FLAGES
RESERVED
RESERVED
RESERVED
RESERVED
RESERVED
RESERVED
INTERRUPT MODE
DISBLE AUTO START
9
IMAGE OF CONTROL FLAGES
RESERVED
RESERVED
RESERVED
RESERVED
RESERVED
RESERVED
RESERVED
DISABLE CAB. BUS INTERFACE
10
IMAGE OF LCD MESSAGE BYTE
11
RESERVED
12
13
14
15
IMAGE OF CONTROLLER'S REVISION INFORMATION

FIG.12



BYTE	BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
0	QUESTIONABLE	TABLE OVERFLOW	FAILED	RESERVED =0				
	REPORTING GROUP NUMBER							
1	QUESTIONABLE	RESERVED=0	FIRST ENCLOSURE PARTICIPATING IN THE REPORTING GROUP ENCLOSURE NUMBER					
2	CABINET NUMBER							
3	QUESTIONABLE	RESERVED=0	SECOND ENCLOSURE PARTICIPATING IN THE REPORTING GROUP ENCLOSURE NUMBER					
4	CABINET NUMBER							
5	QUESTIONABLE	RESERVED=0	THIRD ENCLOSURE PARTICIPATING IN THE REPORTING GROUP ENCLOSURE NUMBER					
6	CABINET NUMBER							
7	QUESTIONABLE	RESERVED=0	FOURTH ENCLOSURE PARTICIPATING IN THE REPORTING GROUP ENCLOSURE NUMBER					
8	CABINET NUMBER							
9	QUESTIONABLE	RESERVED=0	FIFTH ENCLOSURE PARTICIPATING IN THE REPORTING GROUP ENCLOSURE NUMBER					
10	CABINET NUMBER							
11	QUESTIONABLE	RESERVED=0	SIXTH ENCLOSURE PARTICIPATING IN THE REPORTING GROUP ENCLOSURE NUMBER					
12	CABINET NUMBER							
13	QUESTIONABLE	RESERVED=0	SEVENTH ENCLOSURE PARTICIPATING IN THE REPORTING GROUP ENCLOSURE NUMBER					
14	CABINET NUMBER							
15	QUESTIONABLE	RESERVED=0	EIGHTH ENCLOSURE PARTICIPATING IN THE REPORTING GROUP ENCLOSURE NUMBER					
16	CABINET NUMBER							
17	QUESTIONABLE	RESERVED=0	NINTH ENCLOSURE PARTICIPATING IN THE REPORTING GROUP ENCLOSURE NUMBER					
18	CABINET NUMBER							
19	QUESTIONABLE	RESERVED=0	TENTH ENCLOSURE PARTICIPATING IN THE REPORTING GROUP ENCLOSURE NUMBER					
20	CABINET NUMBER							

FIG.13

EP 1 707 865 A2

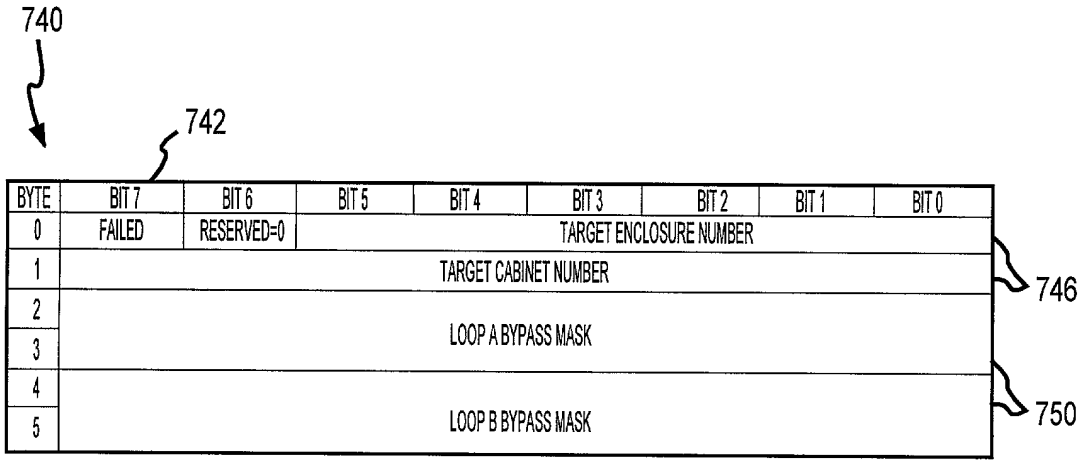


FIG.14

EP 0 704 787 A2